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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/761,623	OKADA ET AL.
	Examiner	Art Unit
	James A. Thompson	2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 December 2005 and 06 January 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-15 and 17-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 January 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/6/06*.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 19 December 2005 have been fully considered but they are not persuasive.

While Examiner does agree with Applicant that the present amendments to the claims, particularly the elimination of the correlation calculating unit and the inclusion of the dissimilarity calculating unit (or corresponding method step language) in the independent claims distinguishes the presently amended claims over the previously applied references. However, the amendments to the independent claims dramatically change the overall scope of the present claims. Furthermore, additional prior art has been discovered which fully teaches the presently amended claims. Accordingly, new grounds of rejection are presented below. The new grounds of rejection have been necessitated by the present amendments to the claims.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 12-15 and 17-22 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 12 recites the limitation "said correlation calculating unit" in line 26. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-4, 11-15, 22-28, 30 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katayama (US Patent 5,537,496) in view of Ball (*Sams Teach Yourself Linux in 24 Hours*, by Bill Ball and Stephen Smoogen, copyright 1998, Sams Publishing and Red Hat Press).

Regarding claims 1, 23 and 25: Katayama discloses an image recording apparatus (figure 1 of Katayama) comprising a first converting unit (figure 1(28) of Katayama) for converting image data into primary data having an N-bit range (column 5, lines 54-60 of Katayama) according to a first gradation conversion characteristic (output resolution) (column 5, lines 9-13 of Katayama); and a second converting unit (figure 1(30) of Katayama) for converting the image data into secondary data having an M-bit range (column 5, lines 61-63 of Katayama) according to a second gradation conversion characteristic (output characteristics of image output device) (column 5, lines 13-16 of Katayama) that is lower in the degree of level compression than the first gradation conversion characteristic or that causes no level compression, wherein M is greater than N (column 6, lines 6-10 of Katayama). Since the secondary data has a greater number of bits to denote pixel density than the

primary data, the secondary data has a lower degree of level compression. Since the secondary data has a greater number of bits, a greater number of levels can be represented between the lowest density and the highest density than with the primary data, which has a fewer number of bits.

Katayama further discloses a dissimilarity calculating unit (figure 1(32) of Katayama) for calculating dissimilarity between the primary data and the secondary data (figure 5 and column 6, lines 8-14 of Katayama) according to each position of each pixel (column 6, lines 3-6 of Katayama) and employing the calculated data as tertiary data (column 6, lines 14-19 of Katayama). The dissimilarity (decimal portion) between the primary (N-bit) data and secondary (M-bit) data (figure 5 and column 6, lines 8-14 of Katayama) is used as tertiary data for the purpose of setting up a K-bit random number generation (column 6, lines 10-19 of Katayama).

Katayama does not disclose expressly a recording unit for recording the primary data and the tertiary data in a file.

Ball discloses a recording unit for storing digital data in a computer file (page 78, lines 5-7 of Ball).

Katayama is analogous art since Katayama is in the same field of endeavor as the present application, namely digital image data conversion, compression, storage and retrieval. Katayama and Ball are combinable because they are from similar problem solving areas, namely the storage and manipulation of computer data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to store said primary and tertiary data, as taught by Katayama, in a file, as taught by Ball. The motivation for doing so would have been to be able to archive the data and thus retrieve and/or transport

said data later (page 78, lines 1-5 of Ball). Therefore, it would have been obvious to combine Ball with Katayama to obtain the invention as specified in claims 1, 23 and 25.

Further regarding claim 23: The apparatus of claim 1 performs the steps of the image processing program of claim 23.

Further regarding claim 25: The apparatus of claim 1 performs the method of claim 25.

Regarding claim 12: Katayama discloses an image recording apparatus (figure 1 of Katayama) comprising a first converting unit (figure 1(28) of Katayama) for converting image data into primary data having an N-bit range (column 5, lines 54-60 of Katayama) according to a first gradation conversion characteristic (output resolution) (column 5, lines 9-13 of Katayama); and a second converting unit (figure 1(30) of Katayama) for converting the image data into secondary data having an M-bit range (column 5, lines 61-63 of Katayama) according to a second gradation conversion characteristic (output characteristics of image output device) (column 5, lines 13-16 of Katayama) that is lower in the degree of level compression than the first gradation conversion characteristic or that causes no level compression, wherein M is greater than N (column 6, lines 6-10 of Katayama). Since the secondary data has a greater number of bits to denote pixel density than the primary data, the secondary data has a lower degree of level compression. Since the secondary data has a greater number of bits, a greater number of levels can be represented between the lowest density and the highest density than with the primary data, which has a fewer number of bits.

Katayama further discloses a dissimilarity calculating unit (figure 1(32) of Katayama) for calculating dissimilarity between

the primary data and the secondary data (figure 5 and column 6, lines 8-14 of Katayama) according to each position of each pixel (column 6, lines 3-6 of Katayama) and employing the calculated data as tertiary data (column 6, lines 14-19 of Katayama). The dissimilarity (decimal portion) between the primary (N-bit) data and secondary (M-bit) data (figure 5 and column 6, lines 8-14 of Katayama) is used as tertiary data for the purpose of setting up a K-bit random number generation (column 6, lines 10-19 of Katayama).

Katayama further discloses irreversibly compressing the primary data (column 6, lines 6-7 of Katayama) and outputting the irreversibly compressed primary data (column 5, lines 35-37 of Katayama). By digitizing the input image data such that the input image data is specifically 8 bits, the input image data is irreversibly compressed.

Katayama further discloses that said dissimilarity calculating unit is a unit for expanding the irreversibly compressed primary data (column 5, lines 61-63 and column 6, lines 6-8 of Katayama), calculating data (decimal part) that determines correlation between the expanded primary and the secondary data (figure 5(decimal part) of Katayama), and employing the calculated data as tertiary data (column 6, lines 8-14 of Katayama).

Katayama does not disclose expressly a recording unit for recording the primary data and the tertiary data in a file, wherein said recording unit performs the compressing and recording taught by Katayama.

Ball discloses a recording unit for storing digital data in a computer file and for compressing and recording digital data (page 78, lines 5-8 of Ball).

Katayama is analogous art since Katayama is in the same field of endeavor as the present application, namely digital image data conversion, compression, storage and retrieval. Katayama and Ball are combinable because they are from similar problem solving areas, namely the storage and manipulation of computer data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to store said primary and tertiary data, as taught by Katayama, in a file, as taught by Ball, and to use the recording unit taught by Ball to compress and record the primary data taught by Katayama. The motivation for doing so would have been to be able to archive the data and thus retrieve and/or transport said data later (page 78, lines 1-5 of Ball). Therefore, it would have been obvious to combine Ball with Katayama to obtain the invention as specified in claim 12.

Regarding claims 2 and 13: Katayama discloses recording the primary data in an image storage segment (figure 4(N bit) of Katayama) to be preferentially referred to (column 6, lines 6-14 of Katayama). Since the primary data is used to select the secondary data and set the random number data (column 6, lines 6-14 of Katayama), the said primary data is clearly preferentially referred to.

Katayama does not disclose expressly that the primary data is recorded in the file by the recording unit.

Ball discloses a recording unit that records digital data in a computer file (page 78, lines 5-7 of Ball).

Katayama is analogous art since Katayama is in the same field of endeavor as the present application, namely digital image data conversion, compression, storage and retrieval. Katayama and Ball are combinable because they are from similar

problem solving areas, namely the storage and manipulation of computer data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to store said primary data in a computer file. The motivation for doing so would have been to be able to archive the data and thus retrieve and/or transport said data later (page 78, lines 1-5 of Ball). Therefore, it would have been obvious to combine Ball with Katayama to obtain the invention as specified in claims 2 and 13.

Regarding claims 3 and 14: Katayama discloses that the tertiary data is recorded in an application segment optionally able to be added (column 6, lines 14-23 of Katayama).

Katayama does not disclose expressly that the tertiary data is recorded in the file.

Ball discloses storing digital data in a computer file (page 78, lines 5-7 of Ball).

Katayama is analogous art since Katayama is in the same field of endeavor as the present application, namely digital image data conversion, compression, storage and retrieval. Katayama and Ball are combinable because they are from similar problem solving areas, namely the storage and manipulation of computer data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to store said tertiary data in a computer file. The motivation for doing so would have been to be able to archive the data and thus retrieve and/or transport said data later (page 78, lines 1-5 of Ball). Therefore, it would have been obvious to combine Ball with Katayama to obtain the invention as specified in claims 3 and 14.

Regarding claims 4 and 15: Katayama discloses that the first gradation conversion characteristic and the second gradation conversion characteristic have the same characteristic curve in at least a part of an entire input signal range (column 6, lines 6-10 of Katayama). Since the secondary data simply has more bits than the primary data, the secondary gradation conversion characteristic has the same characteristic curve as the first gradation conversion characteristic throughout the input signal range.

Regarding claims 11 and 22: Katayama discloses that the second converting unit changes the second gradation curve characteristic in accordance with a feature of the image data (figure 5 and column 6, lines 6-14 of Katayama). The second gradation curve is changed by adding a random number based on the last two bits of the primary data (figure 5 and column 6, lines 6-14 of Katayama).

Regarding claims 24 and 26: Katayama discloses recording the primary data by irreversibly converting it (column 6, lines 6-7 of Katayama); and expanding the irreversibly compressed primary data (column 5, lines 61-63 and column 6, lines 6-8 of Katayama), and calculating data (decimal part) that determines correlation between the expanded primary data and the secondary data (figure 5(decimal part) of Katayama), and employing the calculated data as the tertiary data (column 6, lines 8-14 of Katayama). By digitizing the input image data such that the input image data is specifically 8 bits, the input image data is irreversibly compressed.

Regarding claims 27, 30 and 32: Katayama discloses an image recording apparatus (figure 1 of Katayama) comprising a first converting unit (figure 1(28) of Katayama) for converting

image data into primary data having an N-bit range (column 5, lines 54-60 of Katayama) according to a first gradation conversion characteristic (output resolution) (column 5, lines 9-13 of Katayama); and a second converting unit (figure 1(30) of Katayama) for converting the image data into secondary data having an M-bit range (column 5, lines 61-63 of Katayama) according to a second gradation conversion characteristic (output characteristics of image output device) (column 5, lines 13-16 of Katayama) that is lower in the degree of level compression than the first gradation conversion characteristic or that causes no level compression, wherein M is greater than N (column 6, lines 6-10 of Katayama). Since the secondary data has a greater number of bits to denote pixel density than the primary data, the secondary data has a lower degree of level compression. Since the secondary data has a greater number of bits, a greater number of levels can be represented between the lowest density and the highest density than with the primary data, which has a fewer number of bits.

Katayama further discloses a dissimilarity calculating unit (figure 1(32) of Katayama) for calculating dissimilarity between the primary data and the secondary data (figure 5 and column 6, lines 8-14 of Katayama) according to each position of each pixel (column 6, lines 3-6 of Katayama) and employing the calculated data as tertiary data (column 6, lines 14-19 of Katayama). The dissimilarity (decimal portion) between the primary (N-bit) data and secondary (M-bit) data (figure 5 and column 6, lines 8-14 of Katayama) is used as tertiary data for the purpose of setting up a K-bit random number generation (column 6, lines 10-19 of Katayama).

Katayama further discloses a secondary calculating unit (figure 1(36) of Katayama) for reproducing the secondary data based on the primary data and the tertiary data (column 7, lines 45-51 of Katayama).

Katayama does not disclose expressly a recording unit for recording the primary data and the tertiary data in a file; and a reading unit for reading the primary data and the tertiary data from the file.

Ball discloses a recording unit for storing digital data in a computer file (page 78, lines 5-7 of Ball); and a reading unit for reading digital data from a computer file (page 58, lines 18-24 of Ball).

Katayama is analogous art since Katayama is in the same field of endeavor as the present application, namely digital image data conversion, compression, storage and retrieval. Katayama and Ball are combinable because they are from similar problem solving areas, namely the storage and manipulation of computer data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to store said primary and tertiary data, as taught by Katayama, in a file, as taught by Ball, and also read the primary and tertiary data, as taught by Katayama, from a file, as taught by Ball. The motivation for doing so would have been to be able to archive the data and thus retrieve and/or transport said data later (page 78, lines 1-5 of Ball). Therefore, it would have been obvious to combine Ball with Katayama to obtain the invention as specified in claims 27, 30 and 32.

Regarding claim 28: Katayama discloses that the secondary data calculating unit level-compresses the secondary data so that the data has a bit range gradation-reproducible by an

external apparatus, and outputs the level compressed data (figure 5(L-bit) and column 6, lines 15-24 of Katayama).

6. Claims 6-7, 10, 17-18 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katayama (US Patent 5,537,496) in view of Ball (*Sams Teach Yourself Linux in 24 Hours*, by Bill Ball and Stephen Smoogen, copyright 1998, Sams Publishing and Red Hat Press) and Imai (US Patent 6,038,369).

Regarding claims 6 and 17: Katayama in view of Ball does not disclose expressly that the recording unit compresses the tertiary data by nonlinearly quantizing it and records the compressed tertiary data in the file.

Imai discloses compressing digital image data by nonlinear quantization of said digital data (column 9, lines 61-62 of Imai).

Katayama in view of Ball is combinable with Imai because they are from similar problem solving areas, namely the storage and manipulation of digital computer data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use nonlinear quantization to compress digital image data, as taught by Imai, said digital image data being the tertiary data taught by Katayama, and storing said compressed digital image data in a file, as taught by Ball. The motivation for doing so would have been to store only perceptually critical information (column 9, lines 56-58 of Imai). Therefore, it would have been obvious to combine Imai with Katayama in view Ball to obtain the invention as specified in claims 6 and 17.

Regarding claims 7 and 18: Katayama in view of Ball does not disclose expressly that the recording unit compresses the

tertiary data by increasing a sampling increment of the tertiary data on an image space and records the compressed tertiary data in the file.

Imai discloses compressing digital image data using Huffman coding (column 9, lines 41-47 of Imai), which increases a sampling increment of an image space since Huffman coding minimizes redundancy by recording only perceptually critical information (column 9, lines 41-42 and lines 56-58 of Imai).

Katayama in view of Ball is combinable with Imai because they are from similar problem solving areas, namely the storage and manipulation of digital computer data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use compress digital image data by using Huffman coding, as taught by Imai, said digital image data being the tertiary data taught by Katayama, and storing said compressed digital image data in a file, as taught by Ball. The motivation for doing so would have been to store only perceptually critical information (column 9, lines 56-58 of Imai). Therefore, it would have been obvious to combine Imai with Katayama in view of Ball to obtain the invention as specified in claims 7 and 18.

Regarding claims 10 and 21: Katayama in view of Ball does not disclose expressly that the recording unit compresses the tertiary data by run-length coding, entropy coding, and/or predictive coding, and records the compressed tertiary data in the file.

Imai discloses compressing digital image data using entropy coding (column 9, lines 41-44 of Imai).

Katayama in view of Ball is combinable with Imai because they are from similar problem solving areas, namely the storage

and manipulation of digital computer data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use compress digital image data by using entropy coding, as taught by Imai, said digital image data being the tertiary data taught by Katayama, and storing said compressed digital image data in a file, as taught by Ball. The motivation for doing so would have been to store only perceptually critical information (column 9, lines 56-58 of Imai). Therefore, it would have been obvious to combine Imai with Katayama in view of Ball to obtain the invention as specified in claims 10 and 21.

7. Claims 8-9, 19-20, 29, 31 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katayama (US Patent 5,537,496) in view of Ball (*Sams Teach Yourself Linux in 24 Hours*, by Bill Ball and Stephen Smoogen, copyright 1998, Sams Publishing and Red Hat Press) and Hayashi (US Patent 5,754,683).

Regarding claims 8 and 19: Katayama in view of Ball does not disclose expressly that the recording unit discriminates non-correlation regions that are image areas where a substantial dissimilarity exists between the primary data and the secondary data, and records the tertiary data in the file in a manner that the tertiary data is divided into map data indicating shapes of the non-correlation regions and data indicating values of the non-correlation regions.

Hayashi discloses discrimination non-correlation regions (figure 7(R1-R3) of Hayashi) that are image areas where a substantial dissimilarity (figure 7(ΔX0…ΔX8) of Hayashi) exists between primary image data (figure 7(Pj) of Hayashi) and secondary image data (figure 7(PG) and column 14, lines 31-38 of

Hayashi), and records the tertiary (difference) data in a manner that said tertiary data is divided into map data indicating shapes of the non-correlation regions (figure 6b of Hayashi) and data indicating value of the non-correlation regions (column 14, lines 43-48 of Hayashi). The gradation curve is divided into three regions (figure 7(R1-R3) and column 14, lines 49-51 of Hayashi) and the dissimilarity between a pre-stored gradation curve (figure 7(PG) of Hayashi) and a measured gradation curve (figure 7(Pj) of Hayashi) is measured at several points (column 14, lines 31-38 of Hayashi). The closest shape out of a group of stored shapes (figure 6b of Hayashi) is determined and used, thus mapping and indicating the shapes of the non-correlation regions (column 14, lines 43-48 of Hayashi).

Katayama in view of Ball is combinable with Hayashi because they are from the same field of endeavor, namely digital data processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to determine a gradation curve shape that minimizes error and best matches the measured shape of the gradation curve, as taught by Hayashi, said curves being the primary gradation curve and secondary gradation curve taught by Katayama. The motivation for doing so would have been to decrease processing time by having a pre-determined set of possible gradation curve shapes (column 2, lines 33-38 of Hayashi). Therefore, it would have been obvious to combine Hayashi with Katayama in view of Ball to obtain the invention as specified in claims 8 and 19.

Regarding claims 9 and 20: Katayama in view of Ball does not disclose expressly that the recording unit discriminates a non-coincidence position that is a position in an image where the secondary data cannot be calculated directly from the

primary data, and records the tertiary data at the non-coincidence position in the file.

Hayashi discloses discriminating a non-coincidence position that is a position in a gradation curve (figure 7(G5) of Hayashi), and therefore a corresponding pixel value which would be represented at corresponding positions in an image, where the secondary data (figure 7(PG) of Hayashi) cannot be calculated directly from the primary data (figure 7(Pj) of Hayashi) (column 14, lines 31-38 of Hayashi). The data of the pre-stored gradation curve (figure 7(PG) of Hayashi) cannot be calculated directly from the measured gradation curve (figure 7(Pj) of Hayashi), so the differences between them have to be directly calculated (column 14, lines 31-38 of Hayashi). The tertiary data ($\Delta X0 \ldots \Delta X8$) is recorded at the non-coincidence positions since said tertiary data must be used for calculations at the non-coincidence positions (column 14, lines 43-46 of Hayashi).

Katayama in view of Ball is combinable with Hayashi because they are from the same field of endeavor, namely digital data processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to calculate and record the correction data of the gradation curve, as taught by Hayashi, said correction data being the tertiary data taught by Katayama, into the file, as taught by Ball. The motivation for doing so would have been to decrease processing time by having a pre-determined set of possible gradation curve shapes (column 2, lines 33-38 of Hayashi). Therefore, it would have been obvious to combine Hayashi with Katayama in view of Ball to obtain the invention as specified in claims 9 and 20.

Regarding claims 29, 31 and 33: Katayama discloses an image recording apparatus (figure 1 of Katayama) comprising a

first converting unit (figure 1(28) of Katayama) for converting image data into primary data having an N-bit range (column 5, lines 54-60 of Katayama) according to a first gradation conversion characteristic (output resolution) (column 5, lines 9-13 of Katayama); and a second converting unit (figure 1(30) of Katayama) for converting the image data into secondary data having an M-bit range (column 5, lines 61-63 of Katayama) according to a second gradation conversion characteristic (output characteristics of image output device) (column 5, lines 13-16 of Katayama) that is lower in the degree of level compression than the first gradation conversion characteristic or that causes no level compression, wherein M is greater than N (column 6, lines 6-10 of Katayama). Since the secondary data has a greater number of bits to denote pixel density than the primary data, the secondary data has a lower degree of level compression. Since the secondary data has a greater number of bits, a greater number of levels can be represented between the lowest density and the highest density than with the primary data, which has a fewer number of bits.

Katayama further discloses a dissimilarity calculating unit (figure 1(32) of Katayama) for calculating dissimilarity between the primary data and the secondary data (figure 5 and column 6, lines 8-14 of Katayama) according to each position of each pixel (column 6, lines 3-6 of Katayama) and employing the calculated data as tertiary data (column 6, lines 14-19 of Katayama). The dissimilarity (decimal portion) between the primary (N-bit) data and secondary (M-bit) data (figure 5 and column 6, lines 8-14 of Katayama) is used as tertiary data for the purpose of setting up a K-bit random number generation (column 6, lines 10-19 of Katayama).

Katayama further discloses a secondary calculating unit (figure 1(36) of Katayama) for reproducing the secondary data based on the primary data and the tertiary data (column 7, lines 45-51 of Katayama).

Katayama does not disclose expressly a recording unit for discriminating a non-coincidence position that is a position in an image where the secondary data cannot be calculated directly from the primary data and for recording the primary data and the tertiary data at the non-coincidence position in the file; a reading unit for reading the primary data and the tertiary data from the file; and that said secondary data calculating unit discriminates the non-coincidence positions according to pixel values of the primary data, disposes the tertiary data at the non-coincidence positions and performing positioning between the primary data and the tertiary data, and reproduces the secondary data based on the primary data and the tertiary data that corresponds to the primary data in pixel position.

Ball discloses a recording unit for storing digital data in a computer file (page 78, lines 5-7 of Ball); and a reading unit for reading digital data from a computer file (page 58, lines 18-24 of Ball).

Katayama is analogous art since Katayama is in the same field of endeavor as the present application, namely digital image data conversion, compression, storage and retrieval. Katayama and Ball are combinable because they are from similar problem solving areas, namely the storage and manipulation of computer data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to store said primary and tertiary data, as taught by Katayama, in a file, as taught by Ball, and also read the primary and tertiary data, as

taught by Katayama, from a file, as taught by Ball. The motivation for doing so would have been to be able to archive the data and thus retrieve and/or transport said data later (page 78, lines 1-5 of Ball). Therefore, it would have been obvious to combine Ball with Katayama.

Katayama in view of Ball does not disclose expressly that said recording unit discriminates a non-coincidence position that is a position in an image where the secondary data cannot be calculated directly from the primary data and records the primary data and the tertiary data at the non-coincidence position in the file; and that said secondary data calculating unit discriminates the non-coincidence positions according to pixel values of the primary data, disposes the tertiary data at the non-coincidence positions and performing positioning between the primary data and the tertiary data, and reproduces the secondary data based on the primary data and the tertiary data that corresponds to the primary data in pixel position.

Hayashi discloses discriminating a non-coincidence position that is a position in a gradation curve (figure 7(G5) of Hayashi), and therefore a corresponding pixel value which would be represented at corresponding positions in an image, where the secondary data (figure 7(PG) of Hayashi) cannot be calculated directly from the primary data (figure 7(Pj) of Hayashi) (column 14, lines 31-38 of Hayashi). The data of the pre-stored gradation curve (figure 7(PG) of Hayashi) cannot be calculated directly from the measured gradation curve (figure 7(Pj) of Hayashi), so the differences between them have to be directly calculated (column 14, lines 31-38 of Hayashi). The tertiary data ($\Delta X0 \ldots \Delta X8$) is recorded at the non-coincidence positions

since said tertiary data must be used for calculations at the non-coincidence positions (column 14, lines 43-46 of Hayashi).

Katayama in view of Ball is combinable with Hayashi because they are from the same field of endeavor, namely digital data processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to calculate and record the correction data of the gradation curve according to the non-coincidence positions, as taught by Hayashi, said correction data being the tertiary data taught by Katayama, calculated by the secondary data calculating unit, as also taught by Katayama, into the file using the recording unit, as taught by Ball. The motivation for doing so would have been to decrease processing time by having a pre-determined set of possible gradation curve shapes (column 2, lines 33-38 of Hayashi). Therefore, it would have been obvious to combine Hayashi with Katayama in view of Ball to obtain the invention as specified in claims 29, 31 and 33.

Further regarding claim 31: The apparatus of claim 29 performs the steps of the image processing program of claim 31.

Further regarding claim 33: The apparatus of claim 29 performs the method of claim 33.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Thompson whose telephone number is 571-272-7441. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on 571-272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James A. Thompson
Examiner
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JAT

25 February 2006

David Moore

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